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202213004
B.S. in Computer Science

Anagram 1

```c
#include <stdio.h>
#include <ctype.h>
#include <stdbool.h>

void scan_word(int occurrences[26]) {
    char c;
    while ((c = getchar()) != '\n') {                       // read characters until a new line
        if (isdigit(c)) {                                   // to check if the input is a digit
            printf("You have entered a number. Please enter a word.\n");
            while ((c = getchar()) != '\n') {               // read and discard the remaining characters until a new line
            }
            return scan_word(occurrences);                  // ask for input again
        } else if (isalpha(c)) {                            // check if it is a letter
            occurrences[toupper(c) - 'A']++;                // increment the count for the corresponding letter
        }
    }
}

bool is_anagram(int occurrences1[26], int occurrences2[26]) {
    for (int i = 0; i < 26; i++) {
        if (occurrences1[i] != occurrences2[i]) {           // compare
            return false;                                   // not equal means not an anagram
        }
    }
    return true;                                            // match means anagram
}

int main(void) {
    int occurrences1[26] = {0};                             // initialize array at 0
    int occurrences2[26] = {0};                             // initialize array at 0

    printf("Enter first word: ");
    scan_word(occurrences1);

    printf("Enter second word: ");
    scan_word(occurrences2);

    if (is_anagram(occurrences1, occurrences2)) {
        printf("The words are anagrams.\n");
    } else {
        printf("The words are not anagrams.\n");
    }

    return 0;
}
```

Sample Output

```
Enter first word: smartest
Enter second word: mattress
The words are anagrams.
```

```
Enter first word: hello
Enter second word: world
The words are not anagrams.
```

```
Enter first word: computer
Enter second word: 321
You have entered a number. Please enter a word.
science
The words are not anagrams.
```

Anagram 2

```c
#include <stdio.h>
#include <ctype.h>
#include <stdbool.h>

void scan_word(int* occurrences) {
    char c;
    while ((c = getchar()) != '\n') {                       // read characters until a newline
        if (isdigit(c)) {                                   // to check if the input is a digit
            printf("You have entered a number. Please enter a word.\n");
            while ((c = getchar()) != '\n') {               // read and discard the remaining characters until a new line
            }
            return scan_word(occurrences);                  // ask for user input again
        } else if (isalpha(c)) {                            // to check if it is a letter
            occurrences[toupper(c) - 'A']++;                // count increment
        }
    }
}

bool is_anagram(int* occurrences1, int* occurrences2) {
    for (int i = 0; i < 26; i++) {
        if (occurrences1[i] != occurrences2[i]) {           // compare the two occurences
            return false;                                   // not equal means not an anagram
        }
    }
    return true;                                            // anagram if all counts match
}

int main(void) {
    int occurrences1[26] = {0};                             // initialize array at 0
    int occurrences2[26] = {0};                             // initialize array at 0

    printf("Enter first word: ");
    scan_word(occurrences1);

    printf("Enter second word: ");
    scan_word(occurrences2);

    if (is_anagram(occurrences1, occurrences2)) {
        printf("The words are anagrams.\n");
    } else {
        printf("The words are not anagrams.\n");
    }

    return 0;
}
```

Sample Output

```
Enter first word: smartest
Enter second word: mattress
The words are anagrams.
```

```
Enter first word: computer
Enter second word: science
The words are not anagrams.
```

```
Enter first word: 321
You have entered a number. Please enter a word.
university
Enter second word: school
The words are not anagrams.
```

Github link:

https://github.com/kaisaaaaa/CMSC21/tree/cbbec7dd7e61691604849da6c4f33561a2b9fffa/Lecture11